

WHAT IS CLAIMED IS:

1. A surface layer, comprising:

a substrate element;

a plurality of layers, of which one layer is a transition layer to the substrate element;

wherein the surface layer includes a ceramic layer containing a chemically bonded metal, and wherein the substrate element is a metallic substrate element; and

wherein the transition layer contains intermetallic phases comprising the metal of the substrate element and the metal of the ceramic layer.

2. The surface layer according to Claim 1, wherein the ceramic layer comprises an oxide ceramic.

3. The surface layer according to Claim 1, wherein the ceramic layer comprises at least one of a titanium-containing and silicon-containing oxide ceramic.

4. The surface layer according to Claim 2, wherein the ceramic layer comprises at least one of a titanium-containing and silicon-containing oxide ceramic.

5. The surface layer according to Claim 1, wherein the substrate element comprises an alloy material based on at least one of aluminum and iron.

6. The surface layer according to Claim 2, wherein the substrate element comprises an alloy material based on at least one of aluminum and iron.

7. The surface layer according to Claim 3, wherein the substrate element comprises an alloy material based on at least one of aluminum and iron.

8. The surface layer according to Claim 1, wherein the transition layer contains aluminum titanates and aluminum oxide.

9. The surface layer according to Claim 2, wherein the transition layer contains aluminum titanates and aluminum oxide.

10. The surface layer according to Claim 3, wherein the transition layer contains aluminum titanates and aluminum oxide.

11. The surface layer according to Claim 5, wherein the transition layer contains aluminum titanates and aluminum oxide.

12. A process for producing a surface layer comprised of a plurality of layers, of which one layer is a transition layer to a substrate element, the process comprising the acts of:

    applying a ceramic layer to a metallic substrate element;

    causing a reaction between the metal of the substrate element and the ceramic layer by introducing energy; and

    producing, during said reaction, a transition layer containing intermetallic phases.

13. The process according to Claim 12, wherein the ceramic layer is applied by one of: a thermal spraying process, a slip technique, and by a painting technique.

14. The process according to Claim 12, wherein energy is introduced via at least one of an infrared heating source, a laser, and an induction heat source.

15. The process according to Claim 13, wherein energy is introduced via at least one of an infrared heating source, a laser, and an induction heat source.